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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,733	06/05/2007	Alfons Eiterer	BEET-17	5509
26875 7590 04/28/2009 WOOD, HERRON & EVANS, LLP 2700 CAREW TOWER 441 VINE STREET CINCINNATI, OH 45202				
EXAMINER				
CLARK, MAYA ANGELICA				
ART UNIT		PAPER NUMBER		
3742				
MAIL DATE		DELIVERY MODE		
04/28/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/595,733

Applicant(s)

EITERER ET AL.

Examiner

MAYA CLARK

Art Unit

4128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8 May 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/5508)
Paper No(s)/Mail Date 8 May 2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first and second optical systems as recited in claim 27, and the first and second sensor systems as recited in claim 28 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. No new matter should be entered.

Specification

1. The abstract of the disclosure is objected to because of the following informality: no reference to figure 1 and any associated figure 1 labels should be placed on the abstract page. Correction is required. See MPEP § 608.01(b).

Claim Objections

2. Claim 32 is objected to because of the following informalities: What is the purpose of having a fixed focusing first laser beam while the focusing of the second laser beam is tracked. This statement is not clearly explained. How does a fixed focusing first laser beam relate to the tracking of the focusing of the second laser beam? Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 19-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claim 19 recites the broad recitation the laser beam outlets of the two laser removing devices are fixedly mounted in a manner offset against each other with respect to at least one [axis], and the claim also recites preferably two, axes, more preferably with respect to the two horizontal axes (x, y) which is the narrower statement of the range/limitation.

In the present instance, claim 21 recites the broad recitation at least one of said laser removing devices comprises a beam guide, and the claim also recites preferably through one or more deflection mirrors.

In the present instance, claim 22 recites the broad recitation the laser beam outlet of one or both laser removing devices is slidable with respect to at least one axis, and the claim also recites preferably the vertical axis (z).

In the present instance, claim 29 recites the broad recitation laser pulse frequency of 0.1 to 100Hz, and the claim also recites preferably 1-30 Hz which is the narrower statement of the range/limitation. Claim 29 recites the broad recitation pulse duration of 0.1 to 20ms, and the claim also recites preferably 0.3 to 2 ms which is the narrower statement of the range/limitation. Claim 29 recites the broad recitation pulse peak performance >1 kW, and the claim also recites preferably > 20 kW which is the narrower statement of the range/limitation. Claim 29 recites the broad recitation energy per pulse 1-100 J, and the claim also recites preferably 10-50 J which is the narrower statement of the range/limitation. Claim 29 recites the broad recitation laser type-solid state laser, and the claim also recites in particular diode-pumped or lamp-pumped which is the narrower statement of the range/limitation. Claim 29 recites the broad recitation pulsed laser light, in particular a laser pulse frequency of 1 to 100 kHz, and the claim also recites preferably 10-50k Hz which is the narrower statement of the range/limitation. Claim 29 recites the broad recitation a laser pulse duration of 10 to 1500 ns, and the claim also recites preferably 100 to 500 ns which is the narrower statement of the range/limitation. Claim 29 recites the broad recitation laser

performance 10-200 W, and the claim also recites preferably 20-50 W which is the narrower statement of the range/limitation.

In the present instance, claim 30 recites the broad recitation fixedly mounted in a manner offset against each other with respect to at least one, and the claim also recites preferably two, axes, more preferably with respect to the horizontal axes (x, y).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 19, 20, 21, 23, 24, 27, 28, 29, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al (US 20030006221 A1), hereinafter Hong in view of Inagawa, hereinafter Inagawa (US 5126532), and in further view of Krause (US 6827988), hereinafter Krause.

Regarding claim 19, Hong discloses a workpiece fixture (40) for fastening a workpiece (40), a first laser removing device (110 and 10) using first operating parameters, and a second laser removing device (120 and 20) which can machine a workpiece using second operating parameters that are different from said first operating parameters, especially regarding the quality and/or quantity. Furthermore, the laser beam outlets of the two laser removing devices are fixedly mounted in a manner offset against each other with respect to at least one, preferably two, axes, more preferably

with respect to the two horizontal axes (x, y) as indicated by the axis reference of workpiece fixture (Hong- label 30, figure 3), and mechanical adjustment axes (Hong label 30, figure 3) are provided by means of which the workpiece may be adjusted translatorily with respect to a machine frame such that it may slide between the operating windows of the first and the second laser removal devices (Hong- see figure 5 for labels 40, 110, 10, 120, and 20 and paragraphs 0028 to 0033 on page 2).

The Hong reference is different in that it fails to disclose a first laser removing device for laser drilling a workpiece and a second laser removing device for the production of a die or mold.

Attention is directed to the Inagawa reference which discloses a laser machining apparatus for laser drilling holes into a workpiece (Inagawa-col.1, lines 67-68 and col. 2, lines 1-3). This laser machining apparatus can accurately drill holes in a shorter period of time (Inagawa-col.1, lines 41-42).

It would have been obvious to have modified the Hong reference to incorporate the teachings of Inagawa in order to drill bores i.e. holes because the Inagawa method can accurately produce highly reliable through holes during a short period of time. For example, if a small hole is desired, the Inagawa reference would produce such a hole with excellent bore wall shape while maintaining the desired small diameter (Inagawa-abstract lines 5-8).

The Hong reference is different in that it fails to disclose a laser machining i.e. cutting apparatus that is specifically used for the purpose of machining the workpiece in order to produce the desired mold or die.

Attention is directed to the Krause reference which discloses a laser machining apparatus used to produce a die or mold (Krause-col.3, lines 61-64). This method of producing a die or mold is very simple and straightforward.

It would have been obvious to have modified the Hong reference to include the Krause reference because of its simple ability to produce a mold or die. The laser beam is directed to the machining location, and the laser beam proceeds to cut or carve out the machining location to produce the desired mold or die.

Regarding claim 20, the Hong reference discloses a laser machining apparatus characterized in that the first laser removing device comprises a first laser source (110) and the second laser removing device comprises a second laser source (120); (Hong- fig.5).

Regarding claims 21 and 35, the Hong reference fails to disclose the inclusion of a beam guide preferably through one or more deflection mirrors in at least one of the laser removing devices (claim 21) and the inclusion of a variable beam guide in the second laser removing device (claim 35).

Attention is directed to the Inagawa reference which discloses a laser machining apparatus consisting of a first laser beam from the first laser source (2) being reflected by a mirror (12) i.e. beam guide, and a second laser beam from the first laser source (4) device being reflected by a mirror (14) i.e. beam guide. The use of a beam guide i.e. mirror is an efficient way to deflect the required laser beam.

It would have been obvious to have modified the Hong reference to include the Inagawa reference because of its ease in deflecting the first and second laser beams. As a result, the deflected laser beams are directed to the correct cutting location.

Regarding claim 23, the modified Hong reference fails to explicitly disclose that the laser source is slidable in parallel and in sync to the laser beam outlet.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the modified Hong reference to make the laser source slidable in parallel and in sync to the laser beam outlet since the applicant has not disclosed that such a method solves any stated problem or is for any particular purpose, and it appears that the Hong device would perform equally well with both the slidable laser source and laser beam in parallel and in sync with one another operating in any particular fashion with respect to each other.

Regarding claim 24, the Hong reference discloses a laser machining apparatus characterized in that the first and second laser removing devices (110,10,120 and 20) are controlled by one controller (34) (Hong-fig 5).

The Hong reference fails to disclose the use of two controllers characterized in that there is a first control for controlling the first laser removing device and a second control for controlling the second laser removing device.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the Hong reference to include two controllers instead of one controller since the applicant has not disclosed that having two controllers solves any stated

problem or is for any particular purpose, and it appears that the Hong device could work equally well with any number of controllers.

Regarding claim 27, the Hong reference discloses a laser machining apparatus characterized in that the first laser removing device comprises a first optical system (16), and the second laser removing device comprises a second optical system (26) (Hong-fig.5).

Regarding claim 28, the Hong reference discloses a laser machining apparatus characterized in that the first laser removing device comprises a first sensor system (32), and the second laser removing device comprises a second sensor system (30) (Hong-fig.5).

Regarding claim 29, the Hong reference discloses the use of a Nd:YAG laser which a person ordinarily skilled in the art would know that a Nd:YAG laser is a type of solid state laser involved in the first laser removing device (Hong-paragraph 0035).

The Hong reference does not explicitly state that the Nd:YAG laser can be further specified as a diode pumped or lamp pumped solid state laser.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the Hong reference to have the Nd:YAG solid state laser be a diode pumped or lamp pumped laser since the applicant has not disclosed that having either a diode pumped or lamp pumped solid state laser solves any stated problem or is for any particular purpose, and it appears that the Hong device could work equally well with any type of solid state laser.

Furthermore, the Hong reference discloses the use of a 50 W Nd:YAG laser involved in the second laser removing device. The 50 W laser power falls within the claimed laser performance range of 10-200 W, preferably 20-50 W (Hong-paragraph 0035) for the second laser removing device.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the Hong reference to operate the Nd:YAG laser in a laser performance range of 10-200 W, preferably 20-50 W because discovering a workable laser performance range would have been a mere design consideration based on the desired laser beam machining speed. Such a modification would have involved only routine skill in the art to accommodate the laser performance requirement. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1995)).

7. Claims 22, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Hong reference in view of Henderson et al (US 5338645), hereinafter Henderson.

Regarding claim 22, the modified Hong reference fails to disclose a laser machining apparatus characterized in that the laser beam outlet of one or both laser removing devices is slidable with respect to at least one axis, preferably the vertical axis (z).

Attention is directed to the Henderson reference which discloses a laser machining apparatus characterized in that the laser beam outlet of one laser removing

devices is slidable with respect to at least one axis, preferably the vertical axis (z) (Henderson-figure 1, label 24 and col.2, lines 48-52). The addition of a z-axis driver enables the successful movement of at least one laser beam outlet of one laser removing device.

It would have been obvious to have modified the modified Hong reference to include the Henderson reference in order to have adequate control over the movement of at least one laser beam outlet of one laser removing device. By controlling the movement of at least one laser beam, the laser beam can be easily directed to the desired machining location.

Regarding claims 33 and 34, the Hong reference fails to disclose a method using a process gas during the first and second machining steps of the first and second laser removing devices.

Attention is directed to the Henderson reference which discloses a method using a process or compressed gas (32) in laser machining (Henderson-figure 1). The use of gas assists the laser in removing the cutting residue from the workpiece (Henderson-col.4, lines 9-20).

It would have been obvious to have modified the modified Hong reference to include the Henderson reference because the process gas aids in the removal of cutting residue. The process gas essentially blows away the melted material from the machining area.

8. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Hong reference.

The Hong reference fails to disclose a laser machining apparatus characterized in that the second control operates at a higher clock frequency than the first control.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the Hong reference to include a first control operating at a lower clock frequency while the second control operates at a higher frequency since the applicant has not disclosed that having the second control to operate at a higher clock frequency over the first control would solve any stated problem or is for any particular purpose, and it appears that the modified Hong device could work equally well at any clock frequency.

9. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Hong reference in view of Manor (US 652698 B2).

The Hong reference fails to disclose a laser machining apparatus characterized by an interface between the first and second controls.

Attention is directed to the Manor reference which discloses a dual laser cutting machining apparatus with capabilities that allow for the controlling of the movement of the two laser sources. The first laser beam moves or scans across the workpiece followed by the movement or scanning of the second laser beam (Manor-abstract, lines 1-4 and 14-16). The ability to have control over the movement of the two laser removing devices allows for the laser cutting errors to be reduced.

It would have been obvious to have modified the Hong reference to include the Manor reference because of the resulting reduction in laser cutting errors thereby decreasing laser cutting times and subsequent laser machining cost. For example,

cutting down on errors in laser machining in large scale operations allows for companies to save on costs in the long run.

10. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al (US 20030006221 A1), hereinafter Hong, in view of Krause (US 6827988), hereinafter Krause.

Hong discloses a laser machining method wherein a workpiece (40) is clamped to a workpiece fixture (30) and then machined using laser light, wherein a first operating step of laser drilling is performed through a first laser removing device (110 and 10) using first operating parameters, and a second machining step is performed through a second laser removing device (120 and 20) to machine the workpiece (40) using second operating parameters different from the first operating parameters.

Furthermore, the lasers of both laser removal devices are radiated at laser beam outlets which are fixedly mounted in a manner offset against each other with respect to at least one, preferably two, axes, more preferably with respect to the two horizontal axes (x, y) as indicated by the axis reference of workpiece fixture (30). Also, the workpiece may be adjusted translatorily without changing the clamping with respect to a machine frame using mechanical adjustment axes (30) such that it may be moved between the operating windows of the first and the second laser removal devices (Hong-fig.5 and paragraphs 0028 to 0032 on page 2).

The Hong reference is different in that it fails to disclose a machining i.e. cutting step that is specifically used for the purpose of machining the workpiece in order to produce the desired mold or die.

Attention is directed to the Krause reference which discloses a laser machining apparatus used to produce a die or mold (Krause-col.3, lines 61-64). This method of producing a die or mold is very simple and straightforward.

It would have been obvious to have modified the Hong reference to include the Krause reference because of its simple ability to produce a mold or die. The laser beam is directed to the machining location, and the laser beam proceeds to cut or carve out the machining location to produce the desired mold or die.

11. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Hong reference.

The modified Hong fails to explicitly disclose a method characterized in that a measurement of the distance necessary for the second machining step is performed before the first machining step is taken.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the modified Hong reference to include a method characterized in that a measurement of the distance necessary for the second machining step is performed before the first machining step is taken since the applicant has not disclosed that such a method solves any stated problem or is for any particular purpose, and it appears that the Hong device could perform equally if the measurement of the distance of the second machining step was performed at any time before or after the first machining step.

12. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Hong reference.

The modified Hong reference fails to disclose a method characterized in that during the first machining step using the first laser removing device the focusing of the laser beam is fixed whereas during the second machining step using the second laser removing device the focusing of the laser beam is tracked.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the modified Hong reference to include a method characterized in that during the first machining step using the first laser removing device the focusing of the laser beam is fixed whereas during the second machining step using the second laser removing device the focusing of the laser beam is tracked since the applicant has not disclosed that such a method solves any stated problem or is for any particular purpose, and it appears that the Hong device could perform equally well if the focusing of the first laser beam is fixed while the focusing of the second laser beam is tracked. For example, a lens is typically used to focus laser beams as anyone of ordinarily skilled in the art would know. The type of lens that is used determines how focused to whatever fixed degree that the first laser beam will be. As far as the second laser beam, the modified Hong reference discloses a detector capable of sensing or tracking to what the degree the second lens is focusing the second laser beam.

13. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Hong reference.

The modified Hong reference fails to disclose a method characterized in that during the first machining step using the first laser removing device the relative position of the location of the first laser removing device to the workpiece is changed.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the modified Hong reference to include a method characterized in that during the first machining step using the first laser removing device the relative position of the location of the first laser removing device to the workpiece is changed since the applicant has not disclosed that such a method solves any stated problem or is for any particular purpose. In other words, the modified Hong reference discloses a controller capable of moving the first laser removing device to whatever desired position.

14. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Hong reference.

The modified Hong reference fails to disclose a method characterized in that first the machining step having a higher laser performance is taken and then the machining step having a lower laser performance is taken.

It would have been an obvious matter of design choice to one of ordinary skill in the art to modify the modified Hong reference to include a method characterized in that first the first machining step having a higher laser performance is taken and then the machining step having a lower laser performance is taken since the applicant has not disclosed that such a method solves any stated problem or is for any particular purpose. In other words, depending on the texture of the workpiece being machined, it is simply a design choice to perform first the machining step with the laser beam producing more power followed by the second machining step with the laser beam producing the lesser power in order to prevent damage if the laser beam with the lesser power or performance is done first.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MAYA CLARK whose telephone number is (571)270-5605. The examiner can normally be reached on Monday through Friday, 10 am to 6:00 pm (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoa Huynh can be reached on (571)272-4888. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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